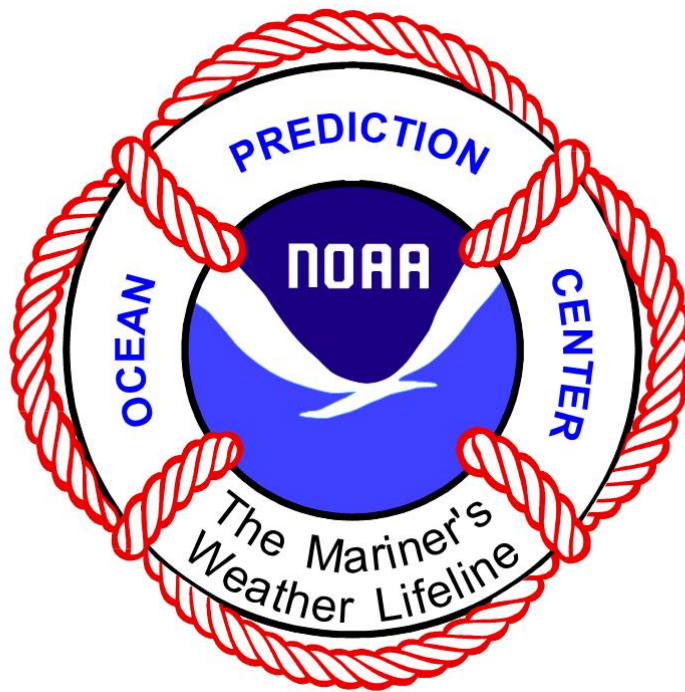


# Ocean Prediction Center

## 2013 Annual Accomplishments



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## 1. Introduction

For the Ocean Prediction Center (OPC), 2013 was a year of both innovation and change. In late Spring OPC made the leap to creating gridded Atlantic and Pacific Offshore forecasts using the AWIPS-II Graphical Forecast Editor (GFE). This complete paradigm shift took years of planning and coordination by the Ocean Applications Branch (OAB) and months of training and transitioning by the Ocean Forecast Branch (OFB). This project allowed OPC to begin distributing forecaster-enhanced gridded data, which had been a request of OPC customers for several years. After the successful implementation of GFE, the OAB slowly began to shift gears and look to the next step in software transitions: AWIPS-II National Centers Perspective.

The OPC also experienced several leadership changes during the year. With Dr. Uccellini selected as the next Director of the National Weather Service (NWS) and Dr. James Hoke retiring from the Weather Prediction Center (WPC), OPC leadership was called upon to fill several vacant positions. Kevin McCarthy assumed the role of Acting WPC Director, and Dr. Ming Ji acted as NCEP Director from mid-summer through the end of the year. Ocean Forecast Branch Chief Anthony Siebers filled in as OPC Acting Director and Deputy Director. Although there was a great deal of shuffling, OPC stepped up to the plate and was able to help create a smooth and seamless transition.

## 2. Major Accomplishments

### *OPC Produces Offshore Gridded Forecasts Using GFE*

After years of preparation and months of training, the OPC transitioned to producing gridded products and forecasts for the Atlantic and Pacific offshore marine zones. On May 1, 2013 OPC started using the Graphical Forecast Editor (GFE) to produce offshore marine forecasts using a gridded database within the Advanced Weather Interactive Processing System (AWIPS II). The gridded database consists of numerical weather prediction model fields edited by the forecasters. The forecasters can blend models or select from a single preferred model to populate the forecast parameters. The OPC started producing wind, wind gust, hazards, and significant wave height grids in three-hourly time steps out through Day 6. The utility of the gridded marine database lies in the capability to derive multiple products from a single data source, including text formatters for the traditional offshore marine forecasts as well as redesigned NAVTEX and high-frequency (HF) voice broadcasts (VOBRA). In addition to the text, graphical, and voice products, GFE now makes these forecaster-edited grids a part of OPC's product suite. The grids are available to the general public through the NWS National Digital Forecast Database (NDFD) website in GRIB2 format and they can be loaded into data portal websites. The grids are an increasingly important product since they give a detailed forecast that goes beyond the limited details that can be contained within a

text product.

The Ocean Applications Branch (OAB) and Ocean Forecast Branch (OFB) members worked tirelessly together to develop and execute a GFE training plan. Several months before the transition, forecasters practiced using GFE to create and send products on the Atlantic and Pacific regional desks. The OAB solicited feedback constantly not only for improving the GFE and its text formatters, but also to gauge the progress of training and to address critical training gaps. The original implementation date of April 1<sup>st</sup> was pushed back one month to allow for additional training to ensure a seamless transition to GFE. After the Offshore desks were fully transitioned to prepare forecasts with GFE, additional training was held. This included short group training sessions that took place during map discussion.

### *OPC Plans to Split Offshore Zones*

User feedback to OPC in recent years has noted that the current Offshore forecast zones are too large to provide detailed forecasts for the needs of most mariners and that the zones are not always aligned with user areas of responsibility and key bathymetric features. In 2013 the OPC decided to redesign the Offshore Atlantic and Pacific forecast zones, keeping the same geographic area, but splitting the existing 8 zones in the Atlantic and 5 zones in the Pacific into 18 and 19 zones, respectively. These zones, seen below in Figures 1 and 2, address many of the OPC users' concerns and were designed to meet their needs for clear, concise forecasts that are aligned with the other NWS marine boundaries.

The other driver behind this large service change was taking advantage of new capabilities provided by GFE. Creating a "digital" forecast database allows OPC the flexibility to generate additional forecasts for smaller zones without a significant increase in workload. The end result is a suite of improved products for OPC customers.

Another advantage of using smaller forecast zones is the increased clarity of depicting hazards on the web, such as the National Weather Service homepage [www.weather.gov](http://www.weather.gov). The original large forecast zones in the OPC Offshore waters area often resulted in the appearance of over-warning for certain regions. When a marine or tropical cyclone warning is issued for any portion of the current large Offshore waters zones, the entire zone is highlighted in the Watch Warning Advisory (WWA) map [www.weather.gov](http://www.weather.gov). This representation has resulted in confusion for OPC's users as well as local NWS forecast offices. The smaller zones offer a solution to this problem by providing more specific areal delineation of warnings and reduce confusion for the user community and the NWS forecast offices.

The zone change package was submitted to NWS headquarters in September, and the process began to officially change OPC's offshore zones. The official zone change is scheduled for 1 April 2014.

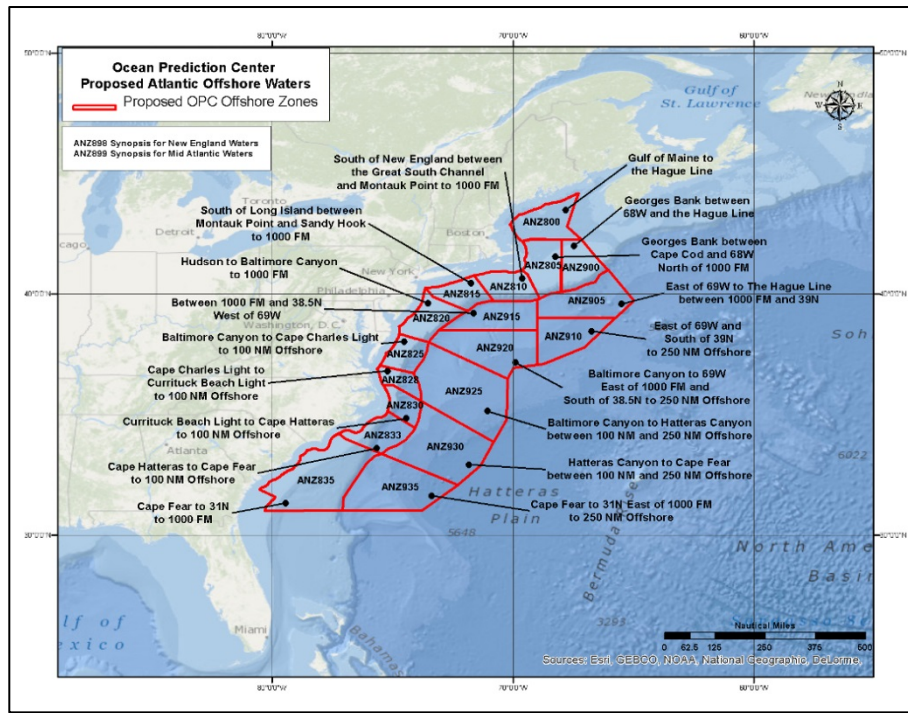


Figure 1: New Atlantic Coastal forecast zones, to be implemented 1 April 2014.

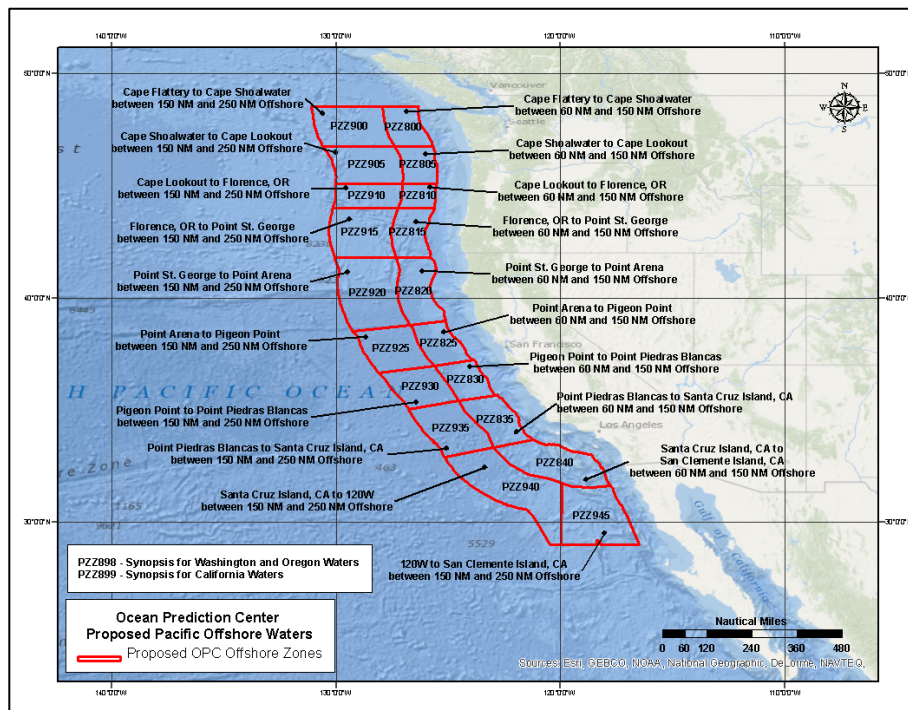


Figure 2: New Pacific Coastal forecast zones, to be implemented 1 April 2014.

### *OPC Produces Lightning Density Product for Marine Interests*

In early 2013 OPC's Ocean Applications Branch partnered with NESDIS StAR, Scott Rudlosky, the OPC/Weather Prediction Center (WPC)/ National Environmental Satellite, Data, and Information Service (NESDIS) Satellite Analysis Branch (SAB) Satellite Proving Ground, and NCEP Central Operations (NCO) System Integration Branch's (SIB) Scott Jacobs to produce a Lightning Strike Density product for application over the ocean. Thunderstorm activity at sea can have significant impacts to the safety of mariners and impact their operations. Presently, only satellite imagery gives mariners at sea an indication of thunderstorm activity beyond the land-based NWS WSR-88D weather radar coverage. Satellite imagery provides the large-scale view over the oceans, but does not provide definitive information concerning whether a particular cloud system is producing lightning.

NOAA affiliate Greg McFadden set up the production process to generate three temporal composites of lightning density in GEMPAK format. This product was introduced to OPC forecast staff in early March and is based on the Vaisala GLD360 global network. The domain extends from the western South Pacific eastward to 75 degrees north latitude, 0 degrees longitude. Three versions of the strike density are being generated, 2-minute, 15-minute, and 30-minute collectives. In October the OPC introduced the experimental web version of the Lightning Strike Density product. Graphical images of the gridded product with GOES visible and IR satellite imagery are available for the Atlantic and Pacific basins at: <http://www.opc.ncep.noaa.gov/lightning> and these images updates 24 hours per day.

The purpose of this lightning strike density product is to enhance the awareness of developing and transitory thunderstorm activity. It gives users the ability to determine whether a cloud system is producing lightning, if that activity is increasing or decreasing, and it emulates future GOES-R satellite Global Lightning Mapper data. Since the graphics are provided in an animated format, the general direction and speed of the lightning activity can be inferred.

### *OPC Starts Twitter Use*

OPC launched its public Twitter account to increase OPC's social media visibility in July after a 30 day in-house test period. OPC's Social Media Group created the Twitter account and helped to define the rules for posting to the account. New tweets about current weather events are posted to create interest and to increase public awareness when deemed appropriate. General information about the OPC's products and services are also posted on Twitter to promote OPC. Similar to the NWS Facebook process, the use of Twitter accounts by OPC employees is governed by existing DOC, NOAA, and NWS Internet policies. Since this is a supplemental tool, OPC may use this technology only as



time and higher priority duties allow. Microblogging services (e.g., Twitter) provide a platform for the OPC to contribute its authoritative voice to the social stream. NWS partners (local to national) have adopted microblogging as a means to disseminate timely information to their communities (including weather/water impacts). Microblogging services offer another platform to distribute/contribute impact information rapidly while also allowing NWS partners to contribute to what is being microblogged.

#### *OPC Hosts United States Coast Guard Academy (USCGA) Summer Intern*

OPC hosted United States Coast Guard Academy (USCGA) Cadet Ali Stinner from 16 June through 27 July 2013. OPC has participated in the USCGA's summer internship program for nearly a decade and has seen many talented future officers come through the program; Cadet Stinner was no exception. During her internship at OPC, Cadet Stinner began to tackle the challenges of predicting thunderstorms in the offshore waters. Specifically, she analyzed storm behavior in three mesoscale convective systems in the Atlantic and Gulf of Mexico offshore forecast zones. She worked closely with OPC, NESDIS, and graduate students to dissect and characterize the storms. Cadet Stinner



United States Coast Guard Academy intern 1/c Alexandra Stinner with her data.

became well versed in surface observations, remotely-sensed wind from scatterometers, and GOES-R proxy products (Vaisala GLD-360 lightning density and overshooting top detection) during her study. She also leveraged her GIS skills and created geographically-referenced files she will analyze with Esri ArcGIS software, tying into NOAA's GIS initiative. Cadet Stinner continued her work with OPC throughout the fall semester, preparing a research poster that was submitted for presentation at the American Meteorological Society Student Conference in January 2014.

### **3. Contribution to NOAA, National, and International Programs**

#### *Visiting Brazilian Scientist*

Captain Silvia Santos Da Silva participated as a visiting scientist at OPC in December 2013. Silvia is an officer in the Brazilian Navy and first spent two months working at the Weather Prediction Center (WPC) international desk before joining OPC to learn about the GOES-R capabilities and products. The knowledge she gained at OPC will help Brazil prepare for when GOES-R is launched and operational. Silvia joined the Brazilian Navy in 2001 and currently works as a marine forecaster for the Navy Hydrographic Center/Marine Meteorological Service. This office is responsible for marine weather forecasts and severe warnings for Brazil's waters. Silvia is also an instructor at the Brazilian Navy Hydrographic Center and participates in the planning, installation, and maintenance of naval meteorological stations.

#### *Satellite Remotely Sensed Data Workshop in South Africa*

Joseph Sienkiewicz of OPC served as lead instructor for a course on the application of satellite remotely sensed winds and wave data in forecast operations held in South Africa in December 2013. The course was the first of its kind in Africa and intended to be a pilot program targeting training officers from African weather services with marine responsibility. Training officers from six African weather services participated in the training. The training was held at the World Meteorological Organization (WMO) Regional Training Center in Pretoria. The three most important issues addressed were: 1) familiarity and applications of satellite sensed ocean winds and waves, 2) the use of fully integrated display and product generation systems to optimize the application, and 3) the identification of a path forward by the student/trainees to increase usage within African of remotely sensed winds and waves, imagery, observations, and Numerical Weather Prediction (NWP) in marine weather services.

#### *4<sup>th</sup> session of the JCOMM Expert Team for Operational Ocean Forecast Systems*

The 4<sup>th</sup> session of the Joint World Meteorological Organization (WMO) – Intergovernmental Oceanographic Commission (IOC) Technical Commission on Oceanography and Marine Meteorology (JCOMM) Expert Team on Operational Ocean Forecast Systems (ETOOFS) was held 25-29 March at NCWCP. Dr. Ming Ji, in his capacity as the JCOMM Service and Forecast Systems Program Area Coordinator, hosted the meeting. NCEP experts Hendrik Tolman and Avichal Mehra of the Environmental Modeling Center (EMC) participated the meeting to provide NCEP contribution to the draft Guide for Operational Ocean Forecasting Systems and demonstrated NOAA capability in tracking oceanic discharge of radioactive hazard materials following the



Fukushima event. Arun Kumar (Climate Prediction Center - CPC) attended the meeting as the representative from the Expert Team on Extended and Long-Range Forecasting (ET-ELRF), under the WMO commission for basic systems) to coordinate with ETOOFS on ocean observing requirements for operational ocean forecast systems (Oofs) and climate forecast systems (CFS). Yan Xue (CPC) also participated in part of the meeting to provide expert input on ETOOFS project developing ocean extremes monitoring capability.

Major progress was achieved in key ETOOFS projects including identifying specific tasks and leaders for updating ocean observing requirements for both Oofs and CFS in support of the WMO Rolling Review of Requirements; assessing technical capability for tracking oceanic discharge of radioactive hazards to support the establishment of an international coordinated support system for response to such events for the global ocean domain; and developing monitoring capability for ocean extremes based on ocean analysis and forecast systems from both Oofs and CFS systems.

#### *2013 Hollings and Student Intern Scholarship Program*

Each year the Hollings and Student Intern Scholarship Program holds an event for the incoming students to help them select intern locations and offices for 2014. The Ocean Prediction Center was invited to participate in this year's Student Scholarship Program which took place May 28 at the NOAA Science Center, Silver Spring, MD. An overview of the OPC was presented to about 150 Hollings students and later in the week they also came to tour the operations at NCWCP.

#### *Ecological Forecasting Workshop*

The NOAA North Atlantic Regional Team convened a group of personnel across Line Offices and from regional academic institutions to explore the capabilities and needs for regional ecological forecasts in May 2013. Partners in planning the workshop included the Cooperative Institute for the North Atlantic Region (CINAR) and the Northeast Regional Association of Coastal Ocean Observing Systems (NERACOOS). The goals for the one-day meeting were to:

- Better coordinate regional efforts with the national Ecological Forecasting Roadmap,
- Identify NOAA capabilities to develop and transition regional integrated ecological forecasts, and
- Develop near-term work plans to advance regional ecological forecasting.

### *International Ocean Surface Vector Winds Science Team*

The Ocean Prediction Center has played a significant role within the science community concerning the operational application of remotely sensed ocean surface winds in support of maritime safety. The International Ocean Surface Vector Winds Science Team (IOVWST) is an excellent venue to engage instrument, algorithm and application developers. The following summarize critical information discussed at IOVWST:

- EUMETSAT plans to continue to operate MetOp-A (with ASCAT-A scatterometer) until MetOp-C is launched and fully functional. MetOp-B is now the operational satellite.
- ASCAT-A and B overlap one swath in coverage with a 50 min temporal difference in sampling. In discussion was suggested to begin to look at data from the two satellites separately to see temporal changes in critical features such as convection. Pairing the scatterometer winds from ASCAT-A and B with lightning strike data shows some promise in revealing associated wind features.
- Indian Space Research Organization (ISRO) and Japan Aerospace Exploration Association (JAXA) with NASA JPL are discussing a scatterometer on GCOM-W2. JAXA and ISRO would like NOAA to bring operational expertise to the effort.
- JAXA was well represented due to both the GCOM-W2 potential and GCOM-W1 contribution to ocean parameters including wind speed. OPC plans on taking full advantage of GCOM-W1 by evaluating AMSR2 wind speeds and bringing them into the operational environment.
- The wind climatology of ocean storms was discussed by Dr. Zorana Jelenak of UCAR/NESDIS StAR. Dr. Shang-Ping Xie of Scripps suggested that the relationship between extreme cyclone activity and climatic indices be investigated. Follow up will continue.

### *International Effort to Implement Weather Overlay on ECDIS*

Over the past year OPC has led the effort on behalf of the NWS and WMO to develop an international digital standard through the International Hydrographic Organization (IHO) for integrating maritime meteorological and oceanographic products and services into Electronic Chart Display and Information Systems (ECDIS) for ship navigation and route planning. This new format for marine weather dissemination promises to be compact, efficient, and will take advantage of new communication and navigation technology commonly used by mariners. In addition to receiving forecasts in a new manner, mariners will have the added value of the ability to overlay the forecast information on their nautical charts and planned routes for advanced decision support. The products will also be available to other users, as the format is in a geo-referenced vector format that is easily loaded into most geographic information systems.

The first major project milestone, submission of an initial package of draft documents to the WMO Expert Team on Maritime Safety Services, was met at the end of the June. This package included a draft feature catalog, which defines the different meteorological and oceanographic features (objects) and their attributes that may be potentially plotted in this format. Through the end of 2013, OPC had received over 50 comments and suggestions from the international community to improve the feature catalog and had the second edited version out for comment. The final approved meteorological and oceanographic feature catalog, product specification, and other associated documents are expected to be completed by April 2014.

#### *EUMETSAT Training for Altimeter Wave Heights*

In November, Joseph Sienkiewicz conducted training in the use of altimeter wave heights for the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT). The training, the Marine Forecasting Course, is a distance learning course designed to train forecasters to improve the quality of marine forecasting and nowcasting through the better use of satellite and model data. The training was attended by 131 marine forecasters from 18 different countries in Europe, Africa, and Asia. There were 66 forecasters online in the middle of the night from Jakarta, Indonesia. The primary use of altimeter data is to diagnose winds and significant wave height. Forecasters also use altimeter data and Visible Infrared Imaging Radiometer Suite (VIIRS) visible imagery to find the ice edge in the Chukchi Sea. The training session is available online at: [http://eumetrain.org/courses/marine\\_forecasting\\_2013.html](http://eumetrain.org/courses/marine_forecasting_2013.html).

## **4. Outreach**

#### *US Sailing National Sailing Program Symposium*

US Sailing is the educational, administrative, and certification organization for public and private sailing clubs and university programs. As an invited speaker at the Symposium that took place in Clearwater, FL, January 25-27, Joseph Sienkiewicz gave two talks; the first talk discussed thunderstorms, severe weather, and NWS warning and forecast services. The second talk consisted of a basic weather primer and drew heavily from NWS web sources. Both talks were well received. It became clear that many sailors are relying heavily on smart phone applications for short-term weather information and may not necessarily know or understand the limitation or sources of that information. Sailing programs are interested in short-term forecasts on the hour to several hour timeframe, similar to aviation needs. US Sailing recognizes that there is a gap in training information concerning weather for sailors and is looking to fill that gap over the next several years.

### *Tall Ships America Annual Conference*

In February Joseph Sienkiewicz took part in the 40th annual conference of Tall Ships America in Erie, PA. Participants included captains, mates, and crews from sail training vessels from around the U.S. and Canada. Mr. Sienkiewicz gave two presentations, a basic marine weather mini-course and overview of the evolution and NWS forecast decisions for Hurricane Sandy and took part in the safety forum. During the Sandy session several people from Lower Manhattan stated that they found the surge predictions confusing and really need to know the expected inundation. Crews were very appreciative of the forecast efforts for Sandy. Several vessels were move to sheltered waters up the Hudson River and suffered no damage but significant storm surge.

### *Safety at Sea Seminar*

The OPC participated in 35th Annual Safety At Sea Seminar hosted by the US Naval Academy Sailing Squadron. Safety at Sea Seminars are required for sailing crews participating in offshore races. The first seminar was hosted by the Naval Academy after the midshipmen board *Alliance* (former *Charisma*) took part in the 1979 Fastnet Race. That race was struck by an intense non-tropical storm and produced horrific sea conditions, high winds, and loss of life. Senior Forecaster Paul Vukits and Applications Branch Chief, Joseph Sienkiewicz took part in the two day event, April 4-5, at the Naval Academy's Alumni Hall. Mr. Vukits and Mr. Sienkiewicz staffed a booth, answered questions concerning NWS and NOAA oceanographic and marine weather products, took part in roundtable discussions for cruising sailors, and gave a Weather Awareness presentation to over 270 sailors. Two major sailing races will take place in June and participation in a Safety At Sea Seminar is required for race participants. The weather awareness presentation can be found at: <http://www.usna.edu/SailingTeam/documents/lectures/SafetyatSea/2013/1445%20Weather.pdf>

### *OPC Outreach to Seven Seas Cruising Association*

Joseph Sienkiewicz attended the Seven Seas Cruising Association (SSCA) Gam on Friday and Saturday, Sep 27 and 28. A Gam is defined as a gathering of sailors and sailing vessels. The event was held on the Rhode River, just south of Annapolis, MD. About 400 cruising sailors took part with 70 boats anchored off of the camp. Weather was a major discussion topic, including downloading GRIB2 files and graphics via HF or satellite communications.

Those in attendance were faithful users of NWS marine warnings, products, and services

for Offshore and High Seas areas. SSCA is an excellent organization for NWS to engage routinely and continue a dialog as OPC migrates to digital production. The group relies on gridded information, typically the Global Forecast System model, as well as graphical analyses and forecasts. They are very interested in using forecaster generated grids produced at OPC and other offices.

#### *OPC Participates in Marine Seminar at Weather Forecast Office (WFO) Newport, NC*

Joseph Sienkiewicz gave a presentation at the Weather Forecast Office (WFO) in Newport, North Carolina at a Marine Training Seminar on September 13, 2013. The Newport forecasters indicated that they “were excited to learn more about OPC development of marine weather grids and how you will be applying them in the future.”

OPC is now producing gridded forecasts that coastal WFO’s can view during the forecast preparation process. Intersite Coordination software is used so each office can see gridded forecasts from neighboring offices. This has helped forecasters collaborate on the gridded forecasts and facilitates more seamless forecasts across boundaries of responsibility. Another important development discussed was the OPC proposed Offshore Marine Forecast Zones which will go into effect in April, 2014. The WFO forecasters appreciated being able to contribute their ideas to the OPC plan and emphasized that it will provide marine users with a more detailed and concise offshore marine forecast.

## **5. Special Activities**

#### *OPC Supports NOAA’s Antarctic Research*

For the past several years the OPC provided forecasts to support NOAA’s Antarctic Ecosystem Research Division, which is part of NOAA Fisheries. The support was for the Antarctic Marine Living Resources unit to help support their biological, economic, and oceanographic research on marine resources throughout the Pacific and Southern Ocean off Antarctica to ensure these populations remain healthy and at sustainable levels. This year the OPC supported two field campaigns: one during Antarctica’s summer and one in the late winter.

The Antarctic summer support season ran from December 18, 2012 through February 28, 2013. During this time the OPC produced a daily pressure/wind forecast centered on the NOAA field camp at Cape Shirreff, Livingston Island (60° 47' W, 62° 28' S). The following feedback was received:

As always, I cannot thank you all enough for the support you've given us. Your forecasts have made a huge shift in our ability to collect data in an efficient and safe manner.

With Very Best Regards,

Douglas Krause  
NOAA/AMLR  
Camp Leader, Cape Shirreff, Livingston Island

On August 21, 2013 OPC started to provide marine forecasts to support NOAA's National Marine Fisheries Service research crew aboard the RVIB *Nathaniel B Palmer* in the South Shetland Islands area of Antarctica. The ship is 308 feet long and is capable of breaking three feet of ice at 3 knots. OPC sent them a daily marine forecast that includes a surface/wind/warnings chart and a wave/ice edge chart as well as currents, salinity and sea surface temperature. Their survey ended in September.



Cape Sheriff Station, Antarctica. Photo credit: NOAA/Ocean Associates Contractor M. Zimmerman



## 6. Awards

### *Cline Awards*

Christopher Juckins, Frances Achorn, and Kevin Achorn received Regional NWS Isaac M. Cline Awards for implementing gridded marine Atlantic and Pacific forecasts at the OPC, resulting in more detailed and consistent products.

James Kells received a Local NWS Isaac M. Cline Award for his leadership in expanding the use of geographic information system products in the OPC's operations.

The Social Media Group, comprised of Timothy Holley, Timothy Collins, Frances Achorn, James Kells, and LT Christine Schultz received a Local NWS Isaac M. Cline Award for moving the OPC into social media and helping to raise the awareness of marine weather.

## 7. Metrics

In 2013 OPC produced 156 products per day with an average of 99.41% timeliness for the year. Over the course of the year, OPC beat its Government Performance and Results Act (GPRA) goals, with the following metrics:

Wind percent correct in 2013: 85.39% (goal = 74%)

Wave Height percent correct in 2013: 83.18% (goal = 75%)

The OPC website recorded 64,374,000 hits during 2013. This total of website visits is a 37.5% increase of 2012 (46,811,000) and is the greatest gain OPC has seen in the past five years. November 2013 recorded the greatest monthly total, receiving 8.8 million hits. The previous monthly record was achieved in October 2012 during Hurricane Sandy, receiving 6.4 million hits.

## 8. OPC Staff

The OPC experienced several personnel changes this year, including a shake-up of management. With the retirement of the Weather Prediction Center's (WPC) Director, Jim Hoke, in May, Kevin McCarthy became the Acting WPC Director and Anthony Siebers stepped up into the OPC Acting Deputy Director role.

In June the OPC welcomed 1/c Ali Stinner, the United States Coast Guard Academy summer intern. 1/c Stinner worked closely with the OAB to study the new experimental

lightning density and overshooting tops products during her ten weeks working at the NCWCP.

Over the summer, Dr. Louis Uccellini was chosen as the Director of the National Weather Service. At the end of July Dr. Ming Ji became the Acting Director of NCEP. Anthony Siebers assumed the role of Acting Director of OPC for the remainder of the calendar year.

At the end of October, the OPC bade farewell to lead forecaster Robert Oszejka. Mr. Oszejka retired after 40 years of service to the government. His career was celebrated by the staff at an All Hands meeting and retirement party.

Also in October, the OPC welcomed aboard an undergraduate meteorology intern from the University of Maryland: Colleen Wilson. Ms. Wilson was brought onboard to continue 2/c Stinner's research, focusing on the use of the lightning density and overshooting tops products during late fall, winter, and early spring.

CAPT Silvia Santos Da Silva of the Brazilian Navy worked closely with the OAB during December. Her focus during her short time with the OPC was to become familiar with the upcoming GOES-R products, bring that knowledge back to Brazil, and begin preparing the Brazilian weather services for the upcoming data from the new satellites.

Over the past year, Howard PhD candidate Benjamin Albright continued to work on this thesis project with Mr. Sienkiewicz.

### *OPC Staff as of 31 December 2013*

#### *Administration*

Director: Dr. Ming Ji

Acting Deputy Director: Anthony Siebers

Secretary: Marsha Morstad

Administrative Officer: Crystal Rickett

#### *Ocean Forecast Branch*

Chief: Anthony Siebers

Senior Marine Forecasters: Scott Prose, James Clark, Douglas Scovil, Paul Vukits

Marine Forecasters: Kevin Achorn, George Bancroft, Kathy Bell, Timothy Collins, Timothy Holley, James Kells, David Kosier, Paul Lee, Hugh McRandal, David Mills, Frank Musconda, James Nolt, Michael Rowland, Todd Shaw

*Ocean Applications Branch*

Chief: Joseph Sienkiewicz

Meteorologist Developer: Frances Achorn, Christopher Juckins

Technical Operations Coordinator: LT Christine Schultz

GOES-R/JPSS Satellite Liaison: Michael Folmer

Contracted Programmer: Gregory McFadden

Contracted Oceanographer: Robert Daniels

Interns: 1/c Ali Stinner, United States Coast Guard Academy; Colleen Wilson, University of Maryland